

Article Overview

The Icelandic Linear Drive Pluggable Optical OSFP is a high-performance, linear optical transceiver designed for next-generation data centers, offering low-latency, high-bandwidth, and power-efficient connectivity.

Overview

The Icelandic Linear Drive Pluggable Optical OSFP combines the OSFP form factor with linear pluggable optics (LPO) technology. OSFP modules are widely used for 400G, 800G, and 1.6T optical links, supporting high-speed data transfer with robust thermal and electrical performance. LPO technology removes the internal DSP (digital signal processor) from the module, replacing it with a transimpedance amplifier (TIA) and high-linearity driver chips, while shifting digital signal processing to the host ASIC. This results in lower power consumption, reduced latency, and simpler module design.

Key Features

- o High Bandwidth: OSFP modules, including OSFP1600 and OSFP-XD, support up to 1.6Tbps per module with 8x200Gbps host interfaces, enabling high-radix, non-blocking network fabrics.
- o Linear Signal Processing: By using linear drivers and TIAs, the module maintains signal integrity without the need for complex DSPs, reducing system latency and operational costs.
- o Thermal Management: Integrated heatsinks and linear drive design allow efficient heat dissipation, supporting high-power operation while maintaining reliability.
- o Pluggability: The module retains hot-swappable capabilities, allowing easy replacement or upgrades without downtime, which is critical for hyperscale AI and cloud data centers.
- o Power Efficiency: LPO reduces module power consumption compared to DSP-based optics, making it suitable for energy-conscious data center deployments.

Applications

The Icelandic Linear Drive Pluggable Optical OSFP is ideal for:

- o AI and ML Clusters: High-bandwidth, low-latency interconnects for GPU-to-GPU or line card-to-line card communication.
- o Hyperscale Data Centers: Dense optical switching fabrics with up to 204.8Tbps per Open Rack Unit using advanced OSFP-XD or XPO modules.
- o High-Performance Networking: Scenarios requiring low bit error rates and efficient signal transmission over short to medium distances, including DR, FR, LR, and SR optical links.

Advantages

- o Reduced Latency: Shifting DSP functions to the host ASIC minimizes processing delays.
- o Lower Power Consumption: Linear drive design avoids power-intensive signal conditioning.
- o High Density: OSFP-XD and similar modules provide up to 4x front-panel density compared to standard OSFP.
- o Operational Flexibility: Supports pay-as-you-grow deployment and diverse optical architectures. In summary, the Icelandic Linear Drive Pluggable Optical OSFP represents a next-generation optical transceiver solution that balances high bandwidth, low latency, and power efficiency, making it particularly suitable for AI-driven and hyperscale data center environments .

By combining a dual-paddle mechanical architecture, integrated liquid-cooling cold plate, clean linear electrical channel, and high

Abstract The 100G-DR-LPO specification by the LPO (Linear Pluggable Optics) MSA defines 100 Gb/s/lane 53.125 GBd PAM4

This article gives a short insight into how LPO technology works, how it differs from DSP

To address this, Macom and NVIDIA first proposed Linear-drive Pluggable Optics (LPO) in

The OSFP-XD solution has attracted significant interest in the market when it was publicly announced in June 2021. The opportunity

The 800GBASE-DR8 OSFP LPO (Linear-drive Pluggable Optics) optical transceiver module is designed

As hyperscale data centers shift toward AI-optimized fabrics and ultra-high-bandwidth switching platforms, the OSFP

In response, several solutions such as Linear Receive Optics (LRO), Linear Pluggable Optics (LPO) and Co-Packaged Optics

It supports applications from 100 m to 10 km and can be deployed in both electrically and optically switched

The OSFP MSA roadmap provides an excellent mechanical and electrical solution for 800G, 1.6T, and 3.2T pluggable optics with

Embodiments of present invention provide a linear-drive pluggable optics (LPO) transceiver. The LPO

Icelandic Linear Drive Pluggable Optical OSFP

transceiver includes a receiver

Non-retimed Linear Drive Pluggable Optics (LPO) was the hottest topic at OFC 2023 and it continued to draw a crowd at the most

Learn how linear pluggable optics (LPOs) reduce power use, cost and latency by eliminating the DSP and enabling efficient AI, ML

Moving the retiming function from an OSFP back into PHY IP in an SoC simplifies linear pluggable optics for energy

It builds on IEEE 802.3 and OIF CEI-112G-LINEAR-PAM4 specifications. It enables Ethernet-like links with 1, 2, 4, or 8 lanes for data

Abstract: This specification defines the electrical connectors, electrical signals and power supplies, mechanical and thermal

Web: <https://bssoda.pl>

